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**Guiding Questions for Evolution Assessment on Thursday Sept 25th**

1. Be able to define:
   1. Adaptations
   2. Natural selection
   3. Fitness
   4. Species
2. Name the “five fingers” of evolution (TEDEd video). How are they related to Hardy-Weinberg equilibrium?
3. Be able to describe how the “five fingers” of evolution can lead to evolution. What conditions, if any, must be present for these mechanisms to occur. Can you give an example? Take time to understand those we less frequently discussed (ex. genetic drift)
4. Why is natural selection the only mechanism of evolution that can result in adaptive evolution?
5. What effects can natural selection have on populations? For example, what types of selection can occur in a population, and how does each affect a population?
6. How does sexual reproduction affect variability in a population?
7. Within a few weeks of treatment with the drug 3TC, a patient’s HIV population consists entirely of 3TC-resistant HIV. Explain how this rapid evolution of drug resistance is an example of natural selection.
8. What is the Hardy-Weinberg principle?
9. Define the variables of the equation for Hardy-Weinberg equilibrium. Make sure you can use this equation to determine allele frequencies and predict genotypic frequencies.
10. It seems that natural selection would work toward genetic unity; the genotypes that are most fit produce the most offspring, increasing the frequency of adaptive alleles and eliminating less beneficial alleles from the population. Yet there remains a great deal of variability within populations of a species. Describe some of the factors that contribute to this genetic variability.
11. Differentiate between allopatric and sympatric speciation.
12. How are speciation and microevolution different?
13. Describe prezygotic and postzygotic reproductive barriers.